PATENT COOPERATION TREATY

21 JAN 2005

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

KRONE GMBH
Beeskowdamm 3-11
D-14167 Berlin
GERMANY

[rubber stamp]

PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

	Date of mailing *(day/month/year)* 29.10.2004
Applicant's or agent's file reference 02-006 PCT	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP 03/07675	16.07.2003	23.07.2002

Applicant
KRONE GMBH ET AL.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the International preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The Applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purpose of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purpose of deciding whether, in that State, the claimed invention is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the IPEA/	Authorized officer:
European Patent Office – Gitschiner Str. 103 D-10958 Berlin Tel. + 49 30 25901 - 0 Fax: + 49 30 25901 - 840	Koster, A Tel. +49 30 25901-726

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or Agent's file reference 02-006 PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP 03/07675	International filing date *(day/month/year)* 16.07.2003	Priority date *(day/month/year)* 23.07.2002
International Patent Classification (IPC) or national classification and IPC H01R4/24		[rubber stamp]
Applicant KRONE GMBH ET AL.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets including this title page.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Instruction 607 of Administrative Instructions of the PCT).

   These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement according to Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand 12.12.2003	Date of completion of this report 29.10.2004
Name and mailing address of the IPEA European Patent Office – Gitschiner Str. 103 D-10958 Berlin Tel. + 49 30 25901 - 0 Fax: + 49 30 25901 – 840	Authorized officer: Stim, J-P Telephone No. +49 30 25901-566

INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

International application No. PCT/EP 03/07675

I. Basis of the report

1. This report has been drawn up on the basis of the following elements *(the replacement sheets received by the receiving office in response to an invitation according to Article 14 are considered in the present report as "originally filed" and are not annexed to the report as they contain no amendments (Rules 70.16 and 70.17).)*:

Description, pages:

1-24 as originally filed

Claims, No.:

1-14 received on 17.07.2004 with the letter of 01.07.2004

Drawings, sheets:

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

☐ the description, pages:

☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been written disregarding (some of) the amendments, which were considered as going beyond the disclosure of the invention, as filed, as is indicated below (Rule 70.2(c)):

(All replacement sheets comprising amendments of this nature should be indicated in point 1 and attached to this report).

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-14
	No:	Claims	
Inventive Step (IS)	Yes:	Claims	1-14
	No:	Claims	
Industrial Applicability (IA)	Yes:	Claims	1-14
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:
   D1: US-A-3390375
   D2: US-B-6346005

2. Document D1 is regarded as the closest prior art to the subject matter of claim 1. It discloses a deflector element having a deflector surface which can be attached to a connector. It is placed over the cable and is arranged such that the deflector surface extends away from the connector towards the cable.

   The subject matter of claim 1 thus differs from the known deflector element in that the deflector element can be pushed into a position on the cable whilst guiding other cables away around the connector.

   The subject matter of claim 1 is thus novel (Article 33(2) PCT).

   The object to be achieved by the present invention can thus be regarded as designing a deflector element such that it can, if necessary, be pulled through interstices in cabling.

   The solution proposed for this object in claim 1 of the present application is based on an inventive step (Article 33(3) PCT) for the following reasons: The deflector element can be arranged in two positions on the cable of the connector. In the first position, the cables are deflected around the connector in the interstices in cabling owing to an angular direction of extent of the deflector surface, away from the connector towards the cable. In a second position, access to the contacts of the connector is allowed and the deflector surface is spaced apart from the connector.

   Claims 2, 3 are dependent on claim 1 and thus likewise meet the requirements of the PCT in relation to novelty and inventive step.

3. Document D1 is regarded as the closest prior art to the subject matter of claims 4, 5, 7, 14. It discloses an electrical connector having a connector element which carries the insulation displacement contacts. These contacts are stamped from metal.

The subject matter of claims 4, 5, 7, 14 thus differs from document D2 in that the connector element is formed from a laminar, insulating substrate which carries the insulation displacement contacts.

The subject matter of claims 4, 5, 7, 14 is thus novel (Article 33(2) PCT).

The object to be achieved by the present invention can thus be regarded as it being possible to simplify the production of a connector having insulation displacement contacts.

The solution proposed for this object in claims 4, 5, 7, 14 of the present application is based on an inventive step (Article 33(3) PCT) for the following reasons: The connector element comprises a laminar, insulating substrate which carries the insulation displacement contacts. As a result, the manufacture of the connector is considerably simplified.

Claims 6, 8, 9, 10, 11, 12, 13 are dependent on claims 4, 5, 7, 14 and thus likewise meet the requirements of the PCT in relation to novelty and inventive step.

CLAIMS

1. A deflector element (14) for use with an electrical connector (10) which can be attached to an electrical cable (16), the deflector element having a deflector surface (88a), and it being possible for said deflector element to be attached to the cable when used with said connector such that it can be pushed on the cable into a first position adjacent to the connector such that the deflector surface is angularly disposed with respect to the direction of extent of the cable so as to converge towards the cable away from the connector, for deflecting electric cabling around the connector when the connector is moved through interstices in the electric cabling by the lead being pulled and can be pushed into a second position on the cable so as to be spaced apart from the connector, it being possible in the second position for the deflector element to allow access to electrical contacts (82) of the connector.

2. The deflector element as claimed in claim 1 having pocket parts for receiving contact parts of the connector.

3. An electrical connector having a deflector element as claimed in claim 1 or claim 2.

4. An electrical connector element (50) having a plurality of insulation displacement contacts (54) and a plurality of electrical contacts (82), the insulation displacement contacts and the electrical contacts being interconnected by electrical conductors (tracks 78), it being possible for the connector element to be received in a socket structure (44) of a connector body of an electrical connector (10) such that the insulation displacement contacts (54) displace the electrical insulation (72) of insulated wires (70) received by the connector body so as to establish an electrical connection between electrical conductors (74) of the wires and the insulation displacement contacts (54), the connector element (50) being formed by a laminar, insulating substrate which carries said insulation displacement contacts (54).

5. An electrical connector (10) having a first part (30) which has a cable receiving part (36) for receiving an end part of an electrical cable (16) such that the cable extends away from the first part (30), at a first side (49) thereof, in a direction transverse to the first part (30), and insulated wires (70) of the cable (16) are received by the first part (30), said first part (30) having, at a location spaced apart from the cable receiving part (36), a mounting structure (44) which receives a first end part (55) of a connector element (50) as claimed in claim 4 such that the insulation displacement contacts (54) of the connector element receive and make electrical contact with said wires (70), said connector element (50) having, at a second end part (57) opposite said first end part

(55), electrical contacts (82) for making electrical connection to electrical contact members (120) of a mating connector device, said connector element (50) extending from said first part (30) of the connector at said first side (49) thereof so as to be generally parallel to said transverse direction.

6. The electrical connector (10) as claimed in claim 5 for mating assembly to a said connector device in the form of a connector module (100) having openings (122) for receiving said electrical contacts (82), said electrical connector (10), when assembled to the connector module (100), being arranged with said side (49) of the first part (30), which is adjacent to and extends transversely over part of the module (100), adjacent to said openings (122), and with the connector element (50) extending therefrom into the module (100) so that said electrical contacts (82) of the connector engage with the contact members (120) of the module, and with said cable receiving part (36) positioned for receiving the cable (16) such that it extends away from the first part (30) adjacent to a side of the module (100).

7. An insulation displacement contact (54) having a structure defining a slot (58), formed between two spaced apart, opposing parts (60) of the structure, for receiving an insulated wire (70), by lateral movement of the wire (70) so that the wire is gripped between the opposing parts (60) and the insulation (72) of the wire is displaced by engagement with at least one of the opposing parts so that an electrical connection is established between an inner conductor (74) of the insulated wire and said at least one opposing part, wherein the opposing parts are formed from an insulating material, a conductive edge part (62) being disposed on the insulating material at said at least one opposing part at a location thereof for making said electrical connection.

8. The insulation displacement contact as claimed in claim 7, wherein said conductive edge part (62) is disposed on the insulating material at said at least one opposing part at an edge surface thereof which defines a side of the slot.

9. The insulation displacement contact as claimed in claim 7, which is arranged for displacement of the wire insulation (72) by engagement with both of the opposing parts (60), a conductive edge part (62) being disposed on the insulating material at the other of said opposing parts, for establishing an electrical connection between said inner conductor and the other said opposing part.

10. The insulation displacement contact as claimed in claim 8, wherein the conductive edge part (62) is disposed on said at least one opposing part at said at least one

opposing part (60) at an edge surface thereof which defines a side of the slot.

11. The insulation displacement contact as claimed in claim 9, wherein the conductive edge parts (62) on the insulating material, at each said opposing part (60) are disposed at edge surfaces of the opposing parts which surfaces define respective sides of the slot.

12. The insulation displacement contact as claimed in one of claims 7 to 11, wherein said structure is formed from a laminar, insulating substrate (52) to which one or each of said conductive edge parts (62) is applied.

13. The insulation displacement contact as claimed in claim 12 in the form of a printed circuit board, conductor tracks (78) being formed on the printed circuit board and electrically coupled to one or each of said conductive edge parts (62).

14. A method of forming an electrical conductor from a hollow body and a part for receiving a connector element as claimed in claim 4 having insulation displacement contacts at one end which are electrically coupled to contacts on fingers at the other end, the fingers extending from openings in the hollow body, the body being in two parts, one having said openings and an entry passageway for an electrical cable having insulated wires, and the other having a socket structure for receiving said one end of said connector element, and said wires, the method including the steps of:

a) passing said wires through said entry passageway and arranging them such that they are received at said socket structure,

b) assembling said connector element so that said one end is received and retained in said socket structure such that the insulation of the wires is displaced by said insulation displacement contacts so as to establish an electrical connection to conductors of the wires and thus to the finger contacts,

c) assembling the body parts so that the connector element is retained in said body with said fingers extending externally thereof, and said finger contacts are positioned externally.